

REMARKS

I. Summary of the Office Action

Claims 1-23 are pending in the application. Claims 1, 11 and 18 are the only independent claims. The Examiner has rejected claims 1-3, 11-13 and 18-20 under 35 U.S.C. §102(b), as being anticipated by U.S. Patent No. 6,065,073 (Booth).

II. Summary of this Reply

The Examiner has rejected independent claims 1, 11 and 18 under 35 U.S.C. §102(b). Claims 1, 11 and 18 have been amended to define still more clearly what Applicants regard as their invention, in terms which distinguish over the art of record,

III. The Present Invention

The present invention provides a system and method for accessing registers of a PHY device in a network. The invention comprises an extended protocol software layer between the protocol and application layers, on the one hand, and the MAC driver, on the other hand. In one embodiment of the invention, the extended protocol layer generates the PHY device register read and write commands and embeds them within standardized Ethernet data packets. The PHY device of the present invention is adapted to distinguish these register read and write command packets from normal data packets and intercept and parse them to retrieve the commands.

In this manner the present invention takes the standard read/write request signals that access the register of a PHY device, which is normally handled using dedicated data paths separate

from the normal, payload data packet processing operation of the network interface and, instead, embed the access requests in a standard payload packet. The PHY device is modified to recognize the difference between those packets that are standard payload data packets containing data for transmission on the network and those data packets that contain PHY device register access requests in accordance with the present invention.

The present invention is directed to the problems in the prior art for accessing the registers of a PHY device as networking technologies develop. For example, new network standards may require that additional registers for controlling new services may need to be added in the PHY device. Previously, such changes would require significant modifications to the MAC device and the MAC driver.

The present invention addresses these problems in the prior art by permitting a PHY device to be replaced with a modified PHY device having additional and/or different control registers without the need to replace the MAC driver and/or MAC device.

The Booth Prior Art Reference

Booth relates to a system and method for auto-polling a status register within a physical layer (PHY) interface to a local area network. The system includes an auto-polling unit which monitors activity on the management interface of the PHY device. When the auto-polling unit detects a lack of activity on the management interface for a predetermined interval, the auto-polling unit reads a first value from the PHY status register. This first status value is then compared to a previously stored value which corresponds to the last PHY status value read by the host CPU. If a mismatch is detected between these two values, an interrupt is generated to the

CPU. The thrust of Booth's invention is summarized in the last line of his Abstract: "This system frees the CPU from having to continually poll the PHY status register to determine if a change in status has occurred".

IV. Response to 102 Rejections

Applicants will first address the rejection of claim 1. As amended claim 1 recites a system for accessing at least one designated register of a PHY device in a communications network. This system comprises an extended protocol layer for generating an access command packet, the access command packet containing an access command to access the at least one designated register of the PHY device. The system further comprises the PHY device, including the at least one designation register, for receiving the access command packet and executing the access command of the access command packet.

Applicants have amended claim 1 to clarify that the access command packet is encapsulated in a standardized data packet. Support for this feature is found, inter alia, in paragraph 24 of the specification. As noted above, this feature enables the invention to overcome various problems in the prior art as it allows the registers of the PHY device to be accessed without the need to modify the conventional MAC device hardware and/or MAC driver software should the network protocol be modified with respect to those registers.

In particular, the present invention takes the standard read/write request signals that access a register of a PHY device, which are normally handled using dedicated data paths separate from the normal payload data packet processing operation of the network interface and, instead, using an extended protocol layer encapsulates the access requests in a standardized data packet.

In paragraph 3 of the Office Action, the Examiner cites sections of Booth (i.e., col. 9: lines 50-55 and col. 10: lines 22-34) as disclosing the extended protocol layer of the present invention. Applicants respectfully disagree. These cited passages of Booth relate to a network interface card (NIC 212) which is described as providing the computer system “with one or more links to an attached LAN (or alternatively different LANs). ...[As] the one or more links provided by NIC 212 may be coupled to different transmission media (that is, different types of physical cabling) NIC 212 is thus configured “to receive network data and convert this received data into a format recognizable by the software-implemented portions of the chosen communications protocol” (col. 10, lines 23-31). This NIC feature of Booth works to dynamically switch between different network interfaces to a LAN and to address the protocols involved.

This NIC feature of Booth is clearly distinguishable from the extended protocol layer recited in claim 1 of the present invention wherein an access command packet, encapsulated in a standardized data packet, is generated and used to access a register of a PHY device. Booth does not address this feature of the invention. In fact, as noted in his patent, Booth describes how access to the PHY is controlled by the “management interface [which] is defined by IEEE standards” (col. 19, lines 3-5). Booth then describes how his invention uses this management interface to conduct the auto-polling feature of his invention (col. 19, lines 13-43).

A rejection under 35 U.S.C. § 102 is proper only if each and every element of the claim is found in a single prior art reference (MPEP § 2131). Booth is silent as the element of claim 1 of an extended protocol layer which generates an access command packet, encapsulated in a standardized data packet, and uses that command packet to access a register of a PHY device.

Moreover, as noted above, Booth uses the industry-standard procedure to perform access to PHY devices. For at least these reasons, claim 1 is patentable over Booth.

Turning to independent claims 11 and 18, Applicants have amended each of these claims in a manner similar to amended claim 1 to clearly recite the features of claim 1 discussed above that distinguish over Booth. Accordingly, they are patentable over Booth for the same reasons.

The other claims currently standing as rejected in this application (i.e., claims 2, 3, 12, 13, 19 and 20) are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Therefore, reconsideration and withdrawal of the rejections of claims 1-3, 11-13 and 18-20 are requested respectfully.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant believes claim 1-23 to be patentable and the application to be in condition for allowance, and requests respectfully issuance of a Notice of Allowance. If any issues remain, the undersigned requests a telephone interview prior to the issuance of an action.

Respectfully submitted,

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